E/CONF.39/D/51
3 Oct.1962
ORIGINAL : ENGLISH

UNITED NATIONS CONFERENCE
ON THE APPLICATION OF SCIENCE AND TECHNOLOGY
FOR THE BENEFIT OF THE LESS DEVELOPED AREAS

Agenda Item: D. 11. 2

Israel

FACTORS DETERMINING THE USE OF FERTILIZERS IN UNDERDEVELOPED COUNTRIES

By Gershom SEGELMAN, B. Sc., M. Sc.,
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Papers have been contributed to the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas as working papers for that Conference. They are published as presented by the contributors, and the contents and the views expressed are those of the contributors. (See notes overleaf.)

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No. 387 **FACTORS DETERMINING THE USE OF FERTILIZERS IN UNDERDEVELOPED COUNTRIES**

D.11.2.

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The use of fertilizer as the most rapid method for developing agricultural production has become axiomatic. Large-scale programmes carried out by a number of international agencies for many years show the importance that is given to this tool of production.

The Freedom from Hunger Campaign initiated last year by the F.A.C. of the United Nations bases itself upon the belief that the use of fertilizers can give an immediate and important rise to the production of food and fibre crops throughout the world.

Unfortunately, a number of problems often arise which have a tendency to negate the efforts and work put in by field demonstration units.

The following are the problems to be considered when introducing fertilizer in the newly developing countries:

1. To convince the farmers to use fertilizers.

Resistance to the introduction of any new methods among traditional land cultivators is well known throughout the world. Problems of local beliefs, of relationships between cultivator and owner, prestige of the tribal or village head, often have more to do with the acceptance of fertilizer use than the most outstanding field demonstrations. It is, therefore, important when making these field demonstrations to see that the local factors which might resist or even propagandize against the use of fertilizers be so integrated into the demonstration programme that they see the material and prestige benefits which can accrue to them as part of this programme. It is important that the field demonstrators be conversant with the local customs, psychology and social relationship in order that his work be successful.

2. Government olicy

Unfortunately, many governments while they give theoretical support to programmes of field demonstrations are convinced that only rapid industrialization can solve their problems and demands for higher living standards and have a tendency to overlook the importance of a strongly productive agricultural base for any industrialization. It is often necessary to convince the local governments that the first steps for industrialization can be based on a conversion of agricultural products and to show them the importance of having an agricultural economy where surplus above the subsistant level is available for use as an item for industrial conversion.

3. Transportation

Being under developed most of the young nations suffer from a very poor transportation system. In many countries the cost of fertilizers to the farmer is double that at the port of entry. Transportation is slow and often not reliable so that fertilizer materials may be available at the storehouses at the port but not available at the proper season in the field. Since building transportation systems are costly and long term it is necessary to convince government agencies that adequate transportation subsidies be paid in order to deliver the fertilizer at a price which is economic to the farmer.

4. Credit

In farming communities living on a subsistent level, or where such cultivator-owner relationships exist that one-quarter to one-half of the crop goes to the owner, conditions make credit facilities highly important. The usual procedure where absentee landowners prevail is for seeds and other materials to be provided on a basis of return after harvest at prohibitive interest rates. In order that fertilizer be introduced, credit facilities must be established by government or local co-operative agencies whose interest is minimal and whose first outlook is the raising of the farmers' productive capacity.

5. Sale of surplus products

Where fertilizer use and other modern methods of production are introduced and farm production rises above the needs of the local community saleable surpluses accumulate. The organization of the handling, transport and sale of these surpluses with adequate return to the farmer will often determine his continuing use of fertilizers and other modern methods. Here again proper transportation facilities, knowledge of what is marketable and sellers co-operatives can do much to give an adequate return to the farmer for his crop. Care should be taken to arrange markets for surplus crops before their production.

6. Fertilizer prices

The smaller, younger and poorer a country is the more expensive its fertilizer prices may be. Countries making large purchases of fertilizers on the world market can usually get maximum benefits from international competition. It is, therefore, of importance that fertilizer purchases where the local demands are still small be channelled through one purchasing agency which will be able to obtain best available prices by large-scale purchases. Price levels can also be maintained by purchasing highly concentrated materials and thus reducing shipping and handling costs. Often the buying of materials in bulk instead of bags and the bagging of the material in the purchasing country will do much to lower the cost of fertilizer

7. Level of extension service

The most expensive international aid programme will not succeed when it is not based on a strong, knowledgeable and enthusiastic local extension service. The extension specialist must know his area, his people and their problems, and not be afraid to demonstrate a particular farming technique with his own hands.

8. The personal enthusiasm of the farmer and the extension worker

Enthusiasm is a term hard to define. It is based on personality, beliefs, tradition, national atmosphere, and many other imponderable factors. One enthusiastic

extension worker can build around him a group of enthusiastic farmers who are willing to attempt new methods, who feel that they are participating in a goal larger than their own personal interests and in the very young countries, especially, are participating in the national development. Each farmer and extension worker must be given the feeling that his accomplishment is meaningful for the country as a whole. Modern psychological techniques make use of advertising and public relations which can do much to make this local worker or farmer important in the eyes of the community and the nation as a whole.

The development of an adequate demonstration programme based on the enthusiastic extension worker can be economically developed for a group of countries as a whole having similar problems. These programmes might, in the beginning years, be carried out in countries which have faced and solved similar problems. To help solve problems of credit, transportation and prices it would be important to organize international seminars where the emphasis would be placed both on extension and organization of purchase and sale co-operatives and transportation problems.

Visits

The organization of visits by outstanding farmer cooperatives to neighbouring areas and countries, or even to more distant countries, can serve both as a reward for successful participation in a fertilization programme or as an incentive and teaching method to show these farmers how similar problems have been solved in other places.

And lastly

use of foreign specialists at a level not commonly accepted. Farmers or farm instructors from participating countries to work in the host countries at the farm level and to break the commonly accepted idea that research stations or government demonstration plots are somehow more productive than the cross-the-road farm cultivator. Where farm level instructors have been used in the last few years the results have been impressive and the enthusiasm has been directed at a level where the demand is greatest.

Each country has its own peculiar problems, and each country's extension worker should be the best person to help overcome these problems. Where the international community can help is to show the local man how these problems have been overcome in other countries and to give him the belief and hope that he, too, can service as a catalytic agent in his country for improving his peoples' standard of living.

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SUMMARY

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By Gershon SEGELMAN, B.Sc., M.Sc.,
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Gershon Segelman, B.Sc. M.Sc.
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Summary

The use of fertilizers as the most rapid method for developing agricultural production is axiomatic.

The following are the problems to be considered when introducing fertilizer use in developing countries:

1. To convince farmer to use fertilizers
2. Government policy
3. Transportation
4. Credit
5. Sale of surplus
6. Fertilizer prices
7. Level of extension service
8. Personal enthusiasm of farmer and extension worker

The demonstration program has to be executed in several countries simultaneously for a duration of several years, and at the same time modern agricultural machinery must be introduced. Such a program would involve the following problems:

1. Education of extension workers in countries having similar problems like the developing countries, i.e. Israel

2. Organization of schools for soil technicians with emphasis on problems like purchase and sale cooperatives and credit and transportation cooperatives.

3. Visits of large groups of farmers to areas where problems similar to their own have been solved.

4. Employment of foreign experts to work on farms together with students who have returned to their own countries.

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